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ENVIRONMENTAL POLICY AS ECONOMIC POLICY

*by Haynes C. Goddard**

The purpose of this article is two-fold: first, to suggest that environmental policy and policy analysis is, in effect, economic policy and policy analysis; and second, to point out that the supply of economic knowledge and analytical economic capability possessed by and available to the government for environmental policy analysis is for the most part insufficient to provide a strong base for making choices to enhance environmental quality in the most efficient manner possible. Discussed below are (a) the reasons for equating environmental and economic policy, (b) the nature of economic analysis, and (c) the kinds of economic knowledge needed for informed decision-making in this area of national concern.

Without denying that most of the physical and social science disciplines will have important inputs to make into policy formation for obtaining social goals for environmental quality, a derivative thesis advanced here is that the peculiar knowledge and methodologies of economics are central to this policy analysis. I define "policy" in this context specifically to mean that set of measures or strategies designed to achieve social objectives—the objectives themselves are not referred to as policies. Social objectives are identified through individual and group preferences expressed and aggregated via the political mechanism, but they also are registered and aggregated in the marketplace—an institution quite clearly economic in nature. For the most part, how these preferences are expressed in the marketplace is the principal cause of environmental problems. In any event, I will not discuss here how objectives are developed.

Basically, environmental policy analysis is that policy analysis which illuminates decisions or choices and their implications about

which environmentally intensive products (those that entail a degree of environmental damage) are to be produced and consumed, how much production of these should occur, and the methods of which the first two decisions are determined and achieved.

These questions, however, are economic questions, and on this basis, it is suggested that economic and environmental policy analysis refer to the same questions and problems. Thus, it is suggested below that the reasoning and decision making criteria developed in the discipline of economics as a social science provide the decision making framework for making choices regarding what is to be produced among marketed and non-marketed goods and services which vary in environmental intensity, and that level of production and consumption of such products and services in the economy which is consistent with environmental goals. Equally important are the methods by which the first two decisions are obtained—that is, there are efficient and inefficient ways to obtain the first two decisions. The purpose of this article is methodological in that the focus here is on showing why the analytical methodologies developed in economics are the appropriate ones for the above determinations. Not discussed here are the substantive issues surrounding the economic costs of air, water and land pollution, nor the substantive issues of precisely which methods (such as permit programs or taxes) should be used to reduce pollution. Therefore, no specific policies are advocated.

THE CAUSES OF ENVIRONMENTAL DECLINE AS ECONOMIC CAUSES

If we expand our view of the causes of environmental degradation to include the human aspects of the problem, we can say that the causes of environmental decline are economic in nature. They are economic in that degradation is a by-product or “joint product” of man’s consumption and production activities. Environmental decline is quite clearly “produced” by the economy although the products are economic “bads” rather than “goods,” since they create disutility rather than utility to consumers.

Furthermore, both public and private economic institutions are implicated in the problem, as illustrated by the much publicized cases of municipalities discharging inadequately treated or untreated waste water into streams and lakes. While it is disconcerting to find that the public institutions to which we must turn to prevent environmental decline are themselves perpetrators of that

decline, it is fairly easy to indicate why this occurs. It results from the behavioral tendency of both public and private producers and consumers to minimize the private or agency costs of production and consumption. Economic man as an individual can be characterized as seeking to monetize as few of the costs of resource use as possible, for in that way he is able to at least temporarily relax the principal constraint on his consumption activity, his income. Economic man consumes both marketed and non-marketed goods and services, and the more of these that an individual can obtain free, the higher the level of his personal economic welfare. Thus, where common property (that is, non-marketed and unpriced) resources exist, such as air and water, they will be treated as "free," or limitless from a consumption point of view, when in fact they are scarce, and thus not "free." Without corrective policies, such as the establishment of property rights, use of these resources cannot be exchanged and thus given their scarcity values. Consequently, producers and consumers will not take account of real resource scarcities because of the zero market price and will overuse these resources, causing environmental decline.

The problem of environmental quality then arises from the way both public and private producers and consumers choose the mix of goods and services they demand, some more environmentally intensive than others, and which in turn are supplied by the economy. There may be a problem with the level of economic activity as well, although much remains to be learned about this question. The rapid rise, for example, in the use of disposable products and non-returnable containers in part reflects the fact that, in most communities, the resources (land, labor and capital) allocated to collection and disposal are not priced to individual waste generators, so that they do not feel the economic implications of their actions. Also, the choice of a transportation technology which is environmentally intensive (air and land) in part reflects the zero price attached to common property resources. In addition, the enormous advances in agricultural productivity in the last thirty years occasioned through increased applications of fertilizer and pesticide technologies with the resultant reduced relative cost of food and fiber to consumers, is now seen to be less cost saving than was once presumed, since fertilizers and pesticides have been overused and have caused increased costs elsewhere.

Thus the choice mechanism used by consumers and producers

in their decision making has been seriously biased, and has led to choices, however rational from an individual perspective, that are irrational from society's standpoint. There are probably few situations involving the use of the environment in which there are no choices open to society—either in terms of allocating the air, water and land among competing and mutually exclusive uses in one period, or allocating them over several periods. The point made here is that any choices regarding allocation of the environment among competing uses to produce market determined incomes or non-marketed “real” incomes (that is, nonmonetary benefits, such as leisure) are largely economic choices. It is not the purpose to suggest here that economics possesses most of the answers to problems of environmental decline; it does not. It is important to note, however, most of the problems of preserving and enhancing environmental quality at the decision making level involve mainly questions of allocating scarce marketed and non-marketed resources among competing uses—a question which economics, particularly microeconomics, is designed to analyze and derive prescriptions.

THE SCIENCE OF OPTIMAL CHOICE

Economics has been called the “science of optimal choice.”¹ It involves a decision making framework which permits comparison among alternatives, and ranking of these alternatives. Virtually anything which is scarce must somehow be allocated among competing uses. Economics seeks to discover and develop the set of “best” decision rules to be employed in allocating any scarce resource. Thus, air, water, love, spouses, time, labor, and capital can be analyzed within the framework of economic analysis. Whether it is marketed, that is, whether it bears a price or not, is of no consequence from a conceptual point of view, although it is usually of consequence from a practical point of view in that the mechanisms for the allocation of novel “economic” resources are not well understood.

In any event, the concept of optimization is central to the economist's perception of man's economic behavior. This is seen in the various behavioral objectives around which most economic theory is organized: utility maximization for the consumer, profit maximization and cost maximization for the producer, and welfare maximization for society. Fundamental to the idea of maximum welfare for individuals and society is the concept of consumer

sovereignty—that is, the range of choice open to individuals and society should be as wide as possible, subject to the constraint that in general the costs of individual actions in terms of claims upon scarce resources (such as the environment) should be made explicit to individual decision makers, both producers and consumers.

Modern economics is very much a child of the Enlightenment in that the basic ethical assumption that each man is the best arbiter of his own welfare underlies the economist's basic theoretical models of behavior and the resultant set of "best" decision rules derived therefrom. This assumption, however, is qualified to the extent that individuals do not have full information regarding costs and benefits. Generally speaking, making appropriate adjustments to the price system and increasing information flows are viewed by most economists as efficient ways to correct inadequacies regarding the use of the environment, rather than outright bans and proscriptions. This is qualified by the costs of obtaining information and by the presence of serious irreversibilities.

With these fairly simple conceptual models, it can be predicted that when the price system (the set of cost constraints confronting decision makers) does not accurately reflect real resource scarcities, environmental problems will result. When these behavioral models are adequately specified both in terms of behavioral variables and causal relationships, corrections with predictable effects can be applied to the price system in order to induce economic behavior which is consistent with desired levels of environmental quality.

The role of economic analysis does not end here, however, for it is important to note that there are efficient and inefficient ways to alleviate environmental decline—this is the point at which the set of optimal decision rules must be developed. There is much danger that in the rush to correct many of the well documented environmental abuses, new inefficiencies will be introduced into the economy, so that the costs of a cleaner environment will be higher than they need be, thus reducing the purchasing power of consumers more than necessary.

In general, however, while statements regarding the applicability of economics in improving environmental quality come fairly easily at this level of abstraction, it must be stated quite emphatically that little is known about either what long range corrections should be made in the economy, or what will be the economic welfare effects if certain actions are chosen, such as the application of tax

and subsidy measures to achieve specific objectives. Thus the knowledge base for economic decision making in this area is not very strong. Some examples are given below.

NEEDED ECONOMIC KNOWLEDGE FOR IMPROVING ENVIRONMENTAL QUALITY

Economic knowledge needed for making informed decisions to increase environmental quality is of two basic types, following a dichotomy commonly used in economics: normative economic knowledge and positive economic knowledge.

Normative economics in this context is that set of value judgments and decision rules regarding what *should* be done to achieve a given set of objectives most effectively. The principal value judgment typically made is that of consumer sovereignty discussed above. In this light, the set of permissible actions is that set which achieves environmental objectives at least cost and at the same time permits maximum consumer choice subject to full costs being explicit. An example of needed economic knowledge of the normative type can be given by reference to the so-called litter problem. It has been maintained that the way to "solve" the litter problem is to tax or ban the offending containers and packaging materials out of existence. Apparently there has been no recognition of the economic fact that there is an optimal amount of litter or littering behavior, that the optimal amount most probably is not a zero amount, and that the litter problem is "solved" when institutions and prices are adjusted to achieve this optimal (probably positive) amount. However, the set of variables and equations which permit solution for the optimal quality of litter is not known, and public policy in this area will be incomplete and on weak foundations until they are known.

Positive economic knowledge in this area refers to the nature and structure of underlying causal economic relationships and interdependencies which permit prediction of the effects of given policy actions. The basic questions here revolve around how producers and consumers behave in their use of the environment with respect to the relative costs or prices of using it. Using the litter illustration again, an example of positive economic knowledge not known is the sensitivity of waste and litter generation rates to the placement of prices or incremental user charges on

collection and disposal, the activities in the solid waste management system to which scarce resources must be allocated.

In general, it is not possible to develop rational and efficient programs for augmenting environmental quality with predictable effects without more knowledge concerning both normative and positive environmental economics. There are efficient and inefficient, effective and ineffective ways to stimulate individual consumers and producers to behave in a manner consistent with societal objectives for environmental quality. The store of both kinds of knowledge is very meager and has been neglected by both the academic community and the Federal government in the past, with the exception of a few isolated efforts. While the presence of great uncertainty regarding the seriousness of certain emissions and effluents creates a need to take temporary corrective measures immediately, policy measures which rely on economic policy instruments, such as excise taxes, subsidies, tax credits and the like, should not be enacted until an adequate appraisal can be made of the kinds of efficient and effective policies that can be used to increase environmental quality.

Unfortunately, the necessary skills for carrying out these analyses are either in short supply or not currently engaged in sufficient amounts in research in these areas. Efforts should be made to increase the supply, and to organize the body of available talent more effectively to increase both the quantity and quality of normative and positive environmental economic knowledge.

CONCLUSION

Environmental policy decisions are in effect economic policy decisions, and economics possesses both a body of knowledge, albeit incomplete, relevant to making decisions regarding the efficient use of the environment and the implications of that use, and more importantly, given the meager knowledge available, a method of thinking and of analysis which is appropriate to developing knowledge and effectuating changes in the economic system to obtain stated goals.

It is important to avoid making policy on the basis of simple *ad hoc* economic analysis and prescriptions, and to avoid making the mistake of concluding that the knowledge needed to make appropriate and efficient decisions regarding environmental policy is available, or more fundamentally, that the necessary skills for

basic and applied economic research are widespread throughout the government or available to it through the usual channels.



FOOTNOTES

* Solid Waste Research Laboratory, National Environmental Research Center, Environmental Protection Agency.

¹ Walsh, V., *An Introduction to Contemporary Microeconomics*, (New York: McGraw-Hill, 1970).